

# CHAPTER 2 ALTERNATIVES ANALYSIS

#### **INTRODUCTION**

This chapter discusses the No-Build alternative, the Preferred Redevelopment Building Program, an Alternative Redevelopment Building Program, an Alternative with more open space and an Alternative with less parking. This chapter provides a qualitative comparison of the Project impacts between the preferred building program and alternative building program as well as providing a narrative addressing the No-Build Alternative, Alternative with more open space and Alternative with less parking.

The formulation and shaping of the Project is the result of the comprehensive planning efforts by the City of Quincy in conjunction with the Redeveloper (Proponents). In developing the Preferred Alternative presented in this document, the Redeveloper worked closely with the City to define the parameters that would result in an economically successful Project, while balancing the environmental impacts and mitigation of the Project. Several concepts were considered in light of the corresponding requirements of the LDA and URDP, including the desired development program mix, site constraints, and economic feasibility. Based on the development objectives targeted for the Project Area set forth by the City and the community, the site design has always contemplated a high-density mixed-use urban redevelopment. The Proponents are committed to mitigating the Project related impacts and redeveloping the Project Area using sustainable development principles, resulting in a redevelopment plan that achieves the goals of the Proponents.

# **Origin of Preferred Building Program**

The preferred building program, which is comprised of 3.73 million square feet of high-density mixed-use redevelopment, outlined in Table 2.1, is the culmination of years of planning and negotiations between the City of Quincy and Redeveloper. The Preferred Building Program achieves the goals and vision of the City's URDP, while at the same time being reviewed by both parties to establish that the program is economically viable in the current and future anticipated economic climate.



<b>Project Alternative</b>	es Analysis	
Constraints		

The redevelopment of downtown Quincy Center presents various development constraints within the Project Area that include the following:

- ➤ Historic Resources
- Existing utility infrastructure capacity
- > Existing surrounding roadway capacity
- > Existing right of way constraints
- Urban Construction phasing and staging
- Maintaining uninterrupted utility service to existing downtown businesses and users during construction
- Maintaining active public roadways and transit routes during construction

The relevant constraints to development are the same for both the preferred building program and the alternative building program. The constraints with appropriate design and mitigation are discussed in more detail in the technical chapters of this report.

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#### **No-Build Alternative**

Under the No-Build Alternative the City's Urban Revitalization and Development Plan will not be implemented, the existing downtown will continue to be underutilized and the Project Area will remain a blighted area of Quincy. The existing Quincy Center is in need of major utility and roadway infrastructure improvements, which are part of the Project. Under the No-Build Alternative, these necessary improvements to replace aged and damaged utility infrastructure would not be constructed.

The No-Build Alternative would result in no new impacts, including beneficial impacts. The No-Build Alternative foregoes the Project's significant economic development potential to create a significant amount of jobs while also generating a significant amount of new tax revenue for the City of Quincy and the Commonwealth. The No-Build Alternative also fails to provide new community open space, transportation and streetscape improvements, as well as new shopping, dining, hospitality and entertainment opportunities to the community and region. While the historic buildings within the Project area would remain in the No-Build alternative, it is not guaranteed that re-use of these buildings would occur in the future, given the blighting influences that have been present in the area for some time.

The No-Build Alternative also fails to realize the goals of the planning and redevelopment initiatives that have been targeted for this area, as described in the Urban Revitalization and Development Plan, Land Disposition Agreement, Quincy Center Zoning Ordinance, and other actions taken by the City and the community to revitalize Quincy Center. For these reasons, the No Build Alternative is not considered a viable practical alternative.

Alternatives Analysis New Quincy Center Redevelopment



# **Preferred Alternative – Preferred Building Program**

The preferred building program, which is comprised of 3.73 million square feet of high-density mixed-use redevelopment, is outlined in Table 2.1. The building program achieves the goals and vision of the City's URDP, while at the same time establishes a program that is economically viable in the current and future anticipated economic climate. Refer to Figure 2.1 for the Preferred Redevelopment Program.

Table 2.1 Existing and Preferred Building Program								
Building Program Use	Existing to be Razed		Existing	to Remain	Proposed New Redevelopment		Net Project Change	
	Gross Area (sf)	Quantity	Gross Area (sf)	Quantity	Gross Area (sf)	Quantity	Gross Area (sf)	Quantity
Office	366,089	-	286,388	0	901,930	-	535,841	-
Medical Office	-	-	-	-	103,628	-	103,628	-
General Retail	261,399	-	27,346	0	250,250	-	(11,149)	-
Supermarket	7,945	-	-	-	54,215	-	46,270	-
Regional Shopping / Superstore	-	-	-	-	130,753	-	130,753	-
Proposed Class Room	-	-	-	-	159,466	-	159,466	-
Residential (Units)	-	-	-	-	1,735,081	1,882	1,735,081	1,882
Health Club (Lockers)	-		-	-	33,709	337	33,709	337
Hotels (Rooms)	-	-	-	-	95,890	173	95,890	173
Restaurants (Seats)	74,069	3,789	24,646	1,040	89,255	2,975	15,186	(814)
Movie Theater (Seats)	21,170	-	-	-	88,493	3,210	67,323	-
Loading/ Service					90,537		90,537	
Structured Parking Spaces	0	842	0	527	-	4,725	-	3,883
Surface Parking Spaces	0	843	-	-	-	21	-	(822)
Total	730,671		338,380		3,733,207		3,002,535	

# **Land Alteration**

The Preferred Alternative (the "Project") will alter lands, which have been previously developed. The existing Project Area within downtown Quincy is an urban center with mainly commercial uses. The Project will disturb approximately 30 acres within the downtown, and impact existing roadways during the implementation of utility infrastructure and transportation improvements.

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#### **Open Space**

The Project Area will include various public amenities including well-designed streets, sidewalks, public squares, and parks. The sidewalks are considered key open spaces, as they are the primary connectors that tie together the various uses, public transit and open spaces within the Project Area and surroundings. Sidewalks shall be designed with trees and landscaping to provide a pedestrian friendly area and to encourage walking.

The public squares and parks within the Project Area will provide critical open space elements within the Project's urban setting. These public areas will provide: a social focal point, venues for seasonal events, and the potential for an outdoor marketplace.

#### **Wetlands**

Due to the limited nature of the work within the 100-Foot Buffer Zone to Bank and Land Under Water Bodies and Waterways (LUWW) under the Preferred Alternative, specific Project alternatives to further minimize or avoid wetland impacts have not been examined. The work proposed within the outer 100-Foot Buffer Zone is located within previously developed and impervious areas as detailed in Chapter 5 – Wetlands. As such, any alternative design will have the same impact, either under the Preferred or Alternative building program. Alternatives to create additional green space and reduce impervious area have been examined comprehensively within the entire Project Area to provide an overall benefit to stormwater management and improved use of the land, and are further described in this Chapter.

# Drainage

The Project will include an advanced stormwater management system that will fully comply with the MassDEP Stormwater Management Policy and the City of Quincy's NPDES PH II MS4 General Permit. The stormwater management system will include structural and non-structural best management practices (BMPs) designed to achieve the water quality and quantity objectives of the Standards. BMPs to be incorporated within the Project Area will include street sweeping, deep sump catch basins, water quality structures, low impact development features and infiltration as subsurface conditions allow.

Low impact development (LID) techniques will also be employed throughout the Project Area where conditions allow. LID features such as bioretention basins, green roofs, and tree box filters will be incorporated into the site design in an effort to "decentralize" the stormwater management system for the Project.

The proposed stormwater improvements will provide a significant upgrade from the existing stormwater collection system within downtown Quincy Center. The existing stormwater collection system is aged and undersized, provides little to no water quality benefits and surcharges frequently during storm events. These issues will be addressed by the resulting improved stormwater management measures incorporated within the Project design.

#### Water/Wastewater

The proposed redevelopment building program is estimated to generate 525,207 gpd of wastewater, an overall net increase of approximately 384,207 gpd. Based on discussions with the



Quincy Department of Public Works, review of City reports, sufficient capacity exists within the municipal sewer system and there are no capacity limitations on the City to discharge into the MWRA system. A detailed analysis of capacity and integrity of the municipal sewer system that services the Project Area can be found in Chapter 7 of this report. Refer to Table 2.2 for wastewater generation rates.

Table 2.2 Preferred Alternative Proposed Wastewater Generation Rates <sup>1</sup>							
Use	Generation Rate <sup>1</sup>	Flow					
Office	1,005,558 GSF of Office @ 75gpd/ 1,000 SF	75,417 gpd					
Retail	250,250 GSF of Retail @ 50gpd/ 1,000 SF	12,513 gpd					
Supermarket	54,215 GSF @ 97gpd/1,000 SF	5,259 gpd					
Regional Shopping/Superstore	130,753 GSF @ 50gpd/1,000 SF	6,538 gpd					
Classroom <sup>2</sup>	159,466 GSF @ 75gpd/ 1,000 SF	11,960 gpd					
Residential <sup>3</sup>	1,883 residential units @ 110 gpd per bedroom (assume 1.3 bedrooms/ unit)	269,269 gpd					
Health Club	337 Lockers @ 20 gpd per locker	6,740 gpd					
Hotel	173 keys @ 110 gpd per key	19,030 gpd					
Restaurants	2,975 seats @ 35 gpd per seat	104,131 gpd					
Movie Theatre <sup>4</sup>	3,210 seats @ 3 gpd/ seat	9,630 gpd					
Structured Parking Spaces	4,721 parking spaces @ 1 gpd/ space	4,721 gpd					
Total Flow 525,207 gpd							

<sup>&</sup>lt;sup>1</sup>Based on 314 CMR 7.15 Calculation of Flows for Sewer Extension or Connection Permits

The preferred redevelopment building program is estimated to have a water demand of approximately 572,536 gallons per day (gpd), an overall net increase of approximately 418,362 gpd relative to existing conditions. Based on discussions with the Quincy Department of Public Works and review of City reports, sufficient capacity and pressure exist within the municipal water supply. The Project will include construction of new water mains to serve the proposed Project and additional water infrastructure where existing water mains are determined to be inadequate. A detailed analysis of the capacity and integrity of the municipal water system that

<sup>&</sup>lt;sup>2</sup>Class room demand conservatively assumed to be equal to office demand

<sup>31.3</sup> bedrooms assumed per residential Unit

<sup>&</sup>lt;sup>4</sup>Movie theatre seats assumed to be equal to one seat per 24 sf



services the Project Area is provided in Chapter 7 of this report. Refer to Table 2.3 for the estimated proposed water demand.

Table 2.3 Preferred Alternative Proposed Water Demand							
Use	Projected Wastewater Flow (gpd) <sup>1</sup>	Anticipated Water use Factor	Water Demand (gpd)				
Office	75,417		82,959				
Retail	12,513		13,764				
Supermarket	5,259		5,785				
Regional Shopping/Superstore	6,538		7,192				
Classroom <sup>2</sup>	11,960	1.1	13,156				
Residential <sup>3</sup>	269,269	1.1	296,196				
Health Club	6,740		7,414				
Hotel	19,030		20,933				
Restaurants	104,131		114,544				
Movie Theatre <sup>4</sup>	9,630		10,593				
	_	Total Water Demand	572,536				

<sup>&</sup>lt;sup>1</sup>Based on 314 CMR 7.15 Calculation of Flows for Sewer Extension or Connection Permits

#### Traffic

A trip generation estimate was prepared for the Preferred Building program using trip generation rates contained within the Institute of Transportation Engineers publication *Trip Generation, 8<sup>th</sup> Edition.* It is reasonable to expect that some trips to the Project Area will be shared between multiple land uses. For example, someone living within the apartments may choose to shop at the retail or dine at the restaurants within the Project Area. Therefore, a reduction in the overall trips experienced on the adjacent roadways can be anticipated as a result of multi-use trips that include stops at more than one use within the Project Area. In addition, the proximity of the Project Area to the MBTA's Quincy Center Station and the availability of bus service throughout the Project Area will result in a reduction in trips due to the availability of transit services. Because the project is located within the central business district and within walking distance to several other area residences, offices, and retail destination locations, it is expected that some of the trips generated by the Project Area will be

<sup>&</sup>lt;sup>2</sup>Class room demand conservatively assumed to be equal to office demand

<sup>31.3</sup> bedrooms assumed per residential Unit

<sup>&</sup>lt;sup>4</sup>Movie theatre seats assumed to be equal to one seat per 24 sf



walking and biking trips. Additionally, not all of the trips will be new to the roadway network. The existing land uses within the Project Area are currently generating trips that will be removed from the roadway network as part of the redevelopment of the Project Area. Many of the retail and restaurant trips generated by the proposed redevelopment are already present in the existing traffic flow passing by the Project Area. For example, some vehicles, which are already on the roadways, may decide to visit the Project Area on their way to another destination. These vehicle trips are known as pass-by trips and are subtracted from the total trips to calculate the total primary or "new" trips that affect the volume of traffic along study area roadways. Table 2.4 provides a summary of the resulting trip generation for the Preferred Building Program.

Т	Table 2.4 Trip Generation Summary – Preferred Building Program							
Time Period	Total Proposed Trips	Total Existing Trips*	Total Net Increase	Internal (Shared- Use) Trips	Transit Trips	Walking & Biking Trips	Pass-by Trips	New Primary Trips
Weekday Daily	61,280	34,727	26,553	6,794	4,828	2,408	202	12,321
Weekday Morning In <u>Out</u> Total	2,299 <u>1,413</u> 3,712	1,365 <u>641</u> 2,006	934 <u>772</u> 1,706	88 <u>88</u> 176	275 <u>195</u> 470	140 <u>86</u> 226	-56 <u>-57</u> -113	487 <u>460</u> 947
Weekday Evening In <u>Out</u> Total	2,988 <u>3,313</u> 6,301	1,262 <u>1,613</u> 2,875	1,726 <u>1,700</u> 3,426	440 <u>440</u> 880	277 <u>329</u> 606	128 <u>158</u> 286	64 <u>42</u> 106	817 <u>731</u> 1,548
Saturday Daily	60,680	32,734	27,946	9,788	3,880	1,962	858	11,458
Saturday Midday In <u>Out</u> Total	3,043 <u>2,534</u> 5,777	1,701 <u>1,418</u> 3,119	1,342 <u>1,116</u> 2,458	350 <u>350</u> 700	197 <u>160</u> 357	101 <u>81</u> 182	73 <u>45</u> 118	621 <u>480</u> 1,101

As shown in Table 2.4, the Preferred Building Program is anticipated to generate approximately 947 new vehicle trips during the weekday morning peak hour, 1,548 new vehicle trips during the weekday evening peak hour, and 1,101 vehicle trips during the Saturday midday peak hour. Below is a summary of the traffic-related impacts associated with the increase in vehicle trips generated by the Preferred Building Program.

# **Parking**

A parking demand estimate was prepared for the Preferred Building Program using parking demand generation rates contained in the Institute of Transportation Engineers publication *Parking Generation, 4<sup>th</sup> Edition.* This analysis indicates that the Alternative Building Program for NQC would generate a peak parking demand of 4,702 parking spaces on a weekday and 3,031 parking spaces on a Saturday. Drivers typically perceive a parking lot to be full when approximately 95 percent of the parking spaces are occupied. Therefore, it is recommended that the number of available parking spaces exceed the peak parking demand by at least 5 percent to minimize recirculation of vehicles looking for parking spaces. Based on a peak parking



demand of 4,702 parking spaces, the parking supply should be at least 4,937 spaces. A total of 5,273 parking spaces will be provided throughout the NQC. Therefore, the proposed parking supply will be adequate to meet the anticipated peak parking demand for the Preferred Building Program.

# **Historic/ Archaeological Resources**

The Preferred Building Program calls for the retention and rehabilitation of the iconic Granite Trust Company building at 1400 Hancock Street; possible salvage of certain elements of selected buildings, and the demolition of the majority of the remaining buildings in the Project Area, most of which are within the Quincy Historic District. Most of these buildings are a single story in height with a very small footprint and are not suitable for reuse in this development. Their roof structures cannot accommodate any additional floors nor can their small footprints be expanded due to the density of the development. The Proponents considered the possible retention of a small number of larger multi-story (3 to 5 stories) existing buildings. These buildings, however, presented a number of challenges due to their structural column layouts and ceiling heights, as well as their overall condition and need for improvements related to safety and other code issues and weatherization. Chapter 9 details the impacts to the individual buildings, the efforts to consider alternatives to demolition, and proposed actions that will mitigate the adverse effects to historic resources as a result of the Preferred Building Program.

#### Air Quality/ GHG

A mesoscale air quality analysis was performed for the Preferred Building Program consistent with MassDEP modeling guidance and using the EPA MOBILE6.2 Mobile Source Emission Factor Model. Mesoscale emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) were calculated for four scenarios: 2012 Existing, 2022 No-Build, 2022 Build, and 2022 Build with Mitigation. The mesoscale analysis predicts that the emissions of VOC and NOx in the project study area for the 2022 Build case will be larger than the emissions for the 2022 No-Build case. Therefore, the Project Proponents will mitigate the potential air quality impacts by committing to a number of transportation demand management (TDM) strategies and roadway/traffic signal improvements for the Project. The TDM measures will improve traffic operations, reduce Project-generated vehicle trips, and reduce project-related motor vehicle air pollutant emissions. These mitigation measures will reduce VOC emissions by 0.10 kg/day and will reduce NOx emissions by 0.11 kg/day, both a decrease of 6% in transportation emissions compared to the 2022 Build case. The proposed TDM measures and roadway/traffic signal improvements constitute all reasonable and feasible traffic mitigation measures for a project that is served by public transportation. Details are provided in Chapters 3 and 4.

A greenhouse gas (GHG) emission analysis was performed for the Preferred Building Program consistent with the EEA "Greenhouse Gas Emissions Policy and Protocol" (May 5, 2010) and using the eQUEST energy design software. Carbon Dioxide (CO2) emissions were calculated for two 2022 Full Build scenarios: (1) the Base Case corresponding to the 8th Edition of the Massachusetts Building Code that adopted the 2009 IECC (the "Code"), and (2) the Preferred Alternative. The Preferred Alternative for the Preferred Building Program, which includes all energy mitigation measures, will reduce total direct and indirect stationary source CO2 emissions by 4,442.7 tons/year, or 25.8% compared to the Base Case, a discussion of the base and methodology for determining the based case is found in Chapter 4 of this DEIR. The energy use of buildings constructed as part of NQC will use 28.6% less energy than is required to meet



the State Building Code. Mitigation measures for motor vehicle emissions will include a number of transportation demand management (TDM) strategies and roadway improvements for the project. These measures will reduce Project-related motor vehicle CO2 emissions by 117.3 tons/year, or 6% compared to the Base Case. The net reduction of the Project's total CO2 emissions (stationary source plus transportation) is 4,560 tons/year, or 23.8% compared to the Base Case.

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### **Alternative Building Program**

As described in previous chapters, alternative development programs have been considered for the Project and have been evaluated throughout the planning process for the New Quincy Center Redevelopment. The Alternative Building Program presented herein is just one of the alternatives considered in the planning for the downtown redevelopment. The Alternative Building Program consists of the same square footage and massing of the Preferred Alternative but consists of a different mix of uses developed to address an alternative mix of commercial tenants. This different mix of uses results in different traffic, water, sewer, GHG and Air Quality impacts. Refer to Figure 2.2 for the Alternative Redevelopment Program.

The Alternative Building Program is summarized in Table 2.5 below:

Table 2.5 Existing and Proposed Alternative Building Program								
Building Program Use	Existing to be Razed		Existing to Remain		Alternative Building Program		Net Project Change	
	Gross Area (sf)	Quantity	Gross Area (sf)	Quantity	Gross Area (sf)	Quantity	Gross Area (sf)	Quantity
Office	366,089	-	286,388	0	901,930	-	535,841	-
Medical Office	-	-	-	-	103,628	-	103,628	-
General Retail	261,399	-	27,346	0	190,250	-	(71,149)	-
Supermarket	7,945	-	-	-	54,215	-	46,270	-
Regional Shopping / Superstore	-	-	-	-	130,753	-	130,753	-
Proposed Class Room	-	-	-	-	159,466	-	159,466	-
Residential (Units)	-	-	-	-	1,735,081	1,882	1,735,081	1,882
Health Club (Lockers)	-		-	-	33,709	337	33,709	337
Hotels (Rooms)	-	-	-	-	95,890	173	95,890	173
Restaurants (Seats)	74,069	3,789	24,646	1,040	149,255	4,975	75,186	1,186
Movie Theater (Seats)	21,170	-	-	-	88,493	3,210	67,323	-
Loading/ Service					90,537		90,537	
Structured Parking Spaces	0	842	0	527	-	4,725	-	3,883
Surface Parking Spaces	0	843	-	-	-	21	-	(822)
Total	730,671		338,380		3,733,207		3,002,535	

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A summary of the impacts generated by the alternative building program are found below.

#### **Land Alteration**

Due to the urban nature of the redevelopment project, the Alternative Building Program and Preferred Building Program will result in the same land alteration impacts. The Alternative Building Program is a variation of the Preferred Building Program, using the same building footprints and massing with varying uses.

#### **Open Space**

The Alternative Building Program has the same Open Space characteristics as described in the Preferred Building Program.

#### Wetlands

The Alternative Building Program has the same Wetland impact and mitigation characteristics as described in the Preferred Building Program.

### Drainage

Both the Preferred and Alternative Building Programs include the implementation of similar updated stormwater management systems to collect and treat surface runoff from the downtown watershed area.

#### Water/Wastewater

The Alternative Building Program is estimated to generate 598,278 gpd of wastewater, an overall net increase of approximately 457,278 gpd, relative to existing conditions. The wastewater generated by the Alternative Building Program is also an increase relative to the Preferred Alternative, and is therefore expected to have a greater impact on the wastewater infrastructure supporting the Project. Table 2.6 summaries the wastewater generation associated with the Alternative Building Program.

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Table 2.6 Proposed Wastewater Generation Rates <sup>1</sup> – Alternative Building Program						
Generation Rate <sup>1</sup>	Flow					
1,005,558 GSF of Office @ 75gpd/ 1,000 SF	75,417 gpd					
190,250 GSF of Retail @ 50gpd/ 1,000 SF	9,513 gpd					
54,215 GSF @ 97gpd/1,000 SF	5,259 gpd					
130,753 GSF @ 97gpd/1,000 SF	12,683 gpd					
159,466 GSF @ 75gpd/ 1,000 SF	11,960 gpd					
1,882 residential units @ 110 gpd per bedroom (assume 1.3 bedrooms/ unit)	269,170 gpd					
337 Lockers @ 20 gpd per locker	6,740 gpd					
173 keys @ 110 gpd per key	19,030 gpd					
4,975 seats @ 35 gpd per seat	174,125 gpd					
3,210 seats @ 3 gpd/ seat	9,630 gpd					
	Generation Rates <sup>1</sup> – Alternative B  Generation Rate <sup>1</sup> 1,005,558 GSF of Office @ 75gpd/ 1,000 SF  190,250 GSF of Retail @ 50gpd/ 1,000 SF  54,215 GSF @ 97gpd/1,000 SF  130,753 GSF @ 97gpd/1,000 SF  159,466 GSF @ 75gpd/ 1,000 SF  1,882 residential units @ 110 gpd per bedroom (assume 1.3 bedrooms/ unit)  337 Lockers @ 20 gpd per locker  173 keys @ 110 gpd per key  4,975 seats @ 35 gpd per seat					

**Structured Parking Spaces** 

The Alternative Building Program is estimated to have a water demand of approximately 652,880 gpd, an overall net increase of approximately 498,706 gpd, relative to existing conditions. The water demand generated by the Alternative Building Program is also an increase relative to the Preferred Alternative, and is therefore expected to have a greater impact on the water infrastructure supporting the Project. Table 2.7 summarizes the projected water demand associated with the Alternative Building Program.

4,746 parking spaces @ 1 gpd/ space

**Total Flow** 

4,746 gpd

598,278 gpd

<sup>&</sup>lt;sup>1</sup>Based on 314 CMR 7.15 Calculation of Flows for Sewer Extension or Connection Permits

<sup>&</sup>lt;sup>2</sup>Class room demand conservatively assumed to be equal to office demand

<sup>&</sup>lt;sup>3</sup>1.3 bedrooms assumed per residential Unit

<sup>&</sup>lt;sup>4</sup>Movie theatre seats assumed to be equal to one seat per 24 sf



Table 2.7 Proposed Water Demand – Alternative Building Program							
Use	Projected Wastewater Flow (gpd) <sup>1</sup>	Anticipated Water use Factor	Water Demand (gpd)				
Office	75,417		82,959				
Retail	9,513		10,464				
Supermarket	5,259		5,785				
Regional Shopping/Superstore	12,683		13,951				
Classroom <sup>2</sup>	11,960	1.1	13,156				
Residential <sup>3</sup>	269,170	1.1	296,087				
Health Club	6,740		7,414				
Hotel	19,030		20,933				
Restaurants	174,125		191,538				
Movie Theatre <sup>4</sup>	9,630		10,593				
		Total Water Demand	652,880				

<sup>&</sup>lt;sup>1</sup>Based on 314 CMR 7.15 Calculation of Flows for Sewer Extension or Connection Permits

#### **Traffic**

A trip generation estimate was prepared for the Alternative Building Program using trip generation rates contained within the Institute of Transportation Engineers publication *Trip Generation, 8<sup>th</sup> Edition.* This analysis indicates that the Alternative Building Program for NQC would generate a total of 69,129 vehicle trips on a weekday and 70,682 vehicle trips on a Saturday. It is reasonable to expect that some trips to the Project Area will be shared between multiple land uses. For example, someone living within the apartments may choose to shop at the retail or dine at the restaurants within the Project Area. Therefore, a reduction in the overall trips experienced on the adjacent roadways can be anticipated as a result of multi-use trips that include stops at more than one use within the Project Area. In addition, the proximity of the Project Area to the MBTA's Quincy Center Station and the availability of bus service throughout the Project Area will result in a reduction in trips due to the availability of transit services. Because the Project is located within the central business district and within walking distance to several other area residences, offices, and retail destination locations, it is expected that some of the trips generated by the Project will be walking and biking trips. Additionally, not all of the

<sup>&</sup>lt;sup>2</sup>Class room demand conservatively assumed to be equal to office demand

<sup>&</sup>lt;sup>3</sup>1.3 bedrooms assumed per residential Unit

<sup>&</sup>lt;sup>4</sup>Movie theatre seats assumed to be equal to one seat per 24 sf



trips will be new to the roadway network. The existing land uses on the Project Area are currently generating trips that will be removed from the roadway network as part of the redevelopment of the Project Area. Many of the retail and restaurant trips generated by the proposed redevelopment are already present in the existing traffic flow passing by the Project Area. For example, some vehicles, which are already on the roadways, may decide to visit the Project Area on their way to another destination. These vehicle trips are known as pass-by trips and are subtracted from the total trips to calculate the total primary or "new" trips that affect the volume of traffic along study area roadways. Table 2.8 provides a summary of the resulting trip generation for the Alternative Building Program.

Tri	Table 2.8 Trip Generation Summary – Alternative Building Program							
Time Period	Total Proposed Trips	Total Existing Trips*	Total Net Increase	Internal (Shared- Use) Trips	Transit Trips	Walking & Biking Trips	Pass-by Trips	New Primary Trips
Weekday Daily	69,129	34,727	34,402	10,688	5,363	1,927	1,265	14,504
Weekday Morning In <u>Out</u> Total	2,743 <u>1,829</u> 4,572	1,365 <u>641</u> 2,006	1,378 <u>1,188</u> 2,566	196 <u>196</u> 392	322 <u>236</u> 557	120 <u>84</u> 204	24 <u>18</u> 43	680 <u>639</u> 1,319
Weekday Evening In <u>Out</u> Total	3,370 <u>3,575</u> 6,945	1,262 <u>1,613</u> 2,875	2,108 <u>1,962</u> 4,070	581 <u>581</u> 1,162	311 <u>344</u> 655	111 <u>124</u> 237	124 <u>77</u> 201	954 <u>797</u> 1,749
Saturday Daily	70,682	32,734	37,948	15,752	4,442	1,533	1,911	13,694
Saturday Midday In <u>Out</u> Total	3,492 2,922 6,414	1,701 <u>1,418</u> 3,119	1,791 <u>1,504</u> 3,295	534 <u>534</u> 1,068	234 <u>189</u> 423	81 <u>65</u> 147	138 <u>95</u> 233	772 <u>596</u> 1,367

The Alternative Building Program is expected to generate a total of 69,129 vehicle trips on a weekday, 4,572 vehicle trips during the weekday morning peak hour, 6,945 vehicle trips during the weekday evening peak hour, 70,682 vehicle trips on a Saturday, and 6,414 vehicle trips during the Saturday midday peak hour. This level of trip generation represents an increase of approximately 10 to 23 percent over the Preferred Alternative.

The Alternative Building Program is expect to generate a total of 14,504 "new" vehicle trips on a weekday, 1,319 new vehicle trips during the weekday morning peak hour, 1,749 new vehicle trips during the weekday evening peak hour, 13,694 new vehicle trips on a Saturday, and 1,367 new vehicle trips during the Saturday midday peak hour. This level of trip generation represents as increase of approximately 13 to 39 percent over the Preferred Alternative. Therefore, the Alternative Building Program is expected to have significantly greater impacts to traffic operations in terms of delay and queues throughout the study area roadway network over the Preferred Alternative.



### **Parking**

A parking demand estimate was prepared for the Alternative Building Program using parking demand generation rates contained in the Institute of Transportation Engineers publication *Parking Generation, 4<sup>th</sup> Edition.* This analysis indicates that the Alternative Building Program for the Project would generate a peak parking demand of 5,214 parking spaces on a weekday and 3,506 parking spaces on a Saturday. This level of parking demand represents an increase of 10.7 percent over the Preferred Alternative on a weekday and an increase of 15.7 percent over the Preferred Alternative on a Saturday. As drivers typically perceive a parking lot to be full when approximately 95 percent of the spaces are occupied, it is recommended that the parking supply exceed the peak parking demand by at least 5 percent. This minimizes recirculation of vehicles looking for parking spaces and reduces traffic volumes on adjacent roadways. Therefore, a total of 5,475 parking spaces would be required to accommodate the Alternative Building Program. A total of only 5,273 off-street parking spaces may be accommodated on the site. Therefore, the available parking supply would not be sufficient to accommodate the peak parking demand and significant recirculation of vehicles looking for parking would occur, thereby increasing the volume of traffic on the adjacent roadways.

#### **Historic/Archaeological Resources**

The Alternative Building Program has the same effects on historic resources as described in the Preferred Alternative.

# Air Quality/GHG

A mesoscale air quality analysis was performed for the Alternative Building Program consistent with MassDEP modeling guidance and using the EPA MOBILE6.2 Mobile Source Emission Factor Model. Mesoscale emissions of volatile organic compounds (VOC) and oxides of nitrogen ( $NO_x$ ) were calculated for four scenarios: 2012 Existing, 2022 No-Build, 2022 Build, and 2022 Build with Mitigation. The mesoscale analysis predicts that the emissions of VOC and  $NO_x$  in the Project study area for the 2022 Build case will be larger than the emissions for the 2022 No-Build case. Therefore, the Project Proponents will mitigate the potential air quality impacts by committing to a number of transportation demand management (TDM) strategies and roadway/traffic signal improvements for the Project. The TDM measures will improve traffic operations, reduce Project-generated vehicle trips, and reduce Project-related motor vehicle air pollutant emissions. These mitigation measures will reduce VOC emissions by 0.10 kg/day and will reduce  $NO_x$  emissions by 0.12 kg/day, both a decrease of 6% in transportation emissions compared to the 2022 Build case. The proposed TDM measures and roadway/traffic signal improvements constitute all reasonable and feasible traffic mitigation measures for a project that is served by public transportation. Details are provided in Chapter 4.

A greenhouse gas (GHG) emission analysis was performed for the Alternative Building Program consistent with the EEA "Greenhouse Gas Emissions Policy and Protocol" (May 5, 2010) and using the eQUEST energy design software. Carbon dioxide (CO<sub>2</sub>) emissions were calculated for two 2022 Full Build scenarios: (1) the Base Case for the Alternative Building Program corresponding to the 8<sup>th</sup> Edition of the Massachusetts Building Code that adopted the 2009 IECC (the "Code"), and (2) the Preferred Alternative for the Alternative Building Program. The



Preferred Alternative for the Alternative Building Program, which includes all energy mitigation measures, will reduce total direct and indirect stationary source  $CO_2$  emissions by 4,468.7 tons/year, or 25.7% compared to the Base Case, a discussion of the base and methodology for determining the base case is found in Chapter 4 of this DEIR. The energy use of buildings constructed as part of the Project will use 28.4% less energy than is required to meet the State Building Code. Mitigation measures for motor vehicle emissions will reduce include a number of transportation demand management (TDM) strategies and roadway improvements for the project. These measures will reduce project-related motor vehicle  $CO_2$  emissions by 125.2 tons/year, or 6% compared to the Base Case. The net reduction of the Project's total  $CO_2$  emissions (stationary source plus transportation) is 4,593.9 tons/year, or 23.6% compared to the Base Case.

The Alternative Building Program has higher electricity and gas use than the Preferred Building Program. As a consequence, the Alternative Building Program total  $CO_2$  emissions are 314.1 tons/year higher than the Preferred Building Program emissions (see Tables 4.23 and 4.24 in Chapter 4).

#### **Impact Summary**

The following section provides a summary of the qualitative assessment of the impacts of the Preferred Alternative compared with the Alternative Building Program in terms of traffic generation, Air Quality/ GHG, water and wastewater impacts. Table 2.9 provides a comparison of these impacts.



Table 2.9 Comparison of Impacts						
Environmental Impacts	Preferred Building Program	Alternative Building Program				
Trip Generation						
Weekday Daily	26,553 (net increase)	34,402 (net increase)				
Weekday Morning Peak Hour	1,706 (net increase)	2,566 (net increase)				
Weekday Evening Peak Hour	3,426 (net increase)	4,070 (net increase)				
Saturday Daily	27,946 (net increase)	37,948 (net increase)				
Saturday Midday Peak Hour	2,458 (net increase)	3,295 (net increase)				
Water Demand	572,536 gpd	652,880 gpd				
Sewer Generation	525,207 gpd	598,278 gpd				
Direct and indirect stationary source CO <sub>2</sub> emissions reduction	4,443 tons/year	4,469 tons/year				
project-related motor vehicle CO <sub>2</sub> emissions reduction	117 tons/ year	125 tons/year				
net reduction of the project's total CO <sub>2</sub> emissions (stationary source plus transportation)	4,560 tons/year	4,594 tons/ year				

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# **Alternative with More Open Space**

The Preferred Alternative has been designed with various public amenities including well-designed streets, sidewalks, public squares, and parks. The sidewalks are considered key open spaces, as they are the primary connectors that tie other uses and public spaces together. Sidewalks are designed with trees and landscaping to provide a pedestrian friendly area and to encourage walking.

The public squares and parks within the Project Area provide for open space elements incorporated into an urban setting. The purposes of the proposed public areas are to provide for: (i) a social focal point, (ii) venues for seasonal events, and (iii) the potential for an outdoor marketplace.



The Quincy Center Redevelopment Project has been designed to provide a high-density mix of uses within the Project Area to activate the community throughout the day. Key to the activation of the community is the pedestrian activity on the sidewalks and throughout the public open spaces designed within the Project. The design team has incorporated the interconnected public open spaces within the dense urban fabric of the New Quincy Center Project.

The proposed interconnected open spaces within the Project are sized appropriately and incorporated into the downtown to provide important public amenities. In addition to the surface public open spaces, green roofs are proposed to serve as additional outdoor amenities for building occupants.

The Preferred Alternative carefully balances the need for urban high density mixed-use redevelopment with new, usable public open space. The Preferred Building Program has been carefully designed based on current and forecasted economic conditions to allow for flexibility. This building program is also critically important to underwrite the cost of the significant Core Public Improvements that are integral to the revitalization of Quincy Center. For these reasons, providing additional open space would risk compromising the building program and decrease the urban density, which would be inconsistent with the planning and economic development goals for the revitalization of downtown.

#### **Alternative with Less Parking**

The Preferred Alternative has been designed to provide an appropriate number of parking spaces to provide the minimum parking required to accommodate the peak parking demand and limit excessive recirculation of vehicles on area roadways while looking for empty parking spaces. Based on a parking demand analysis, a total of 5,173 parking spaces should be provided on the site to meet the peak parking demands and avoid excessive recirculation. The Preferred Alternative has been designed to provide a total of 5,273 parking spaces on the site.

The majority of the parking spaces will be shared between all uses on the site to maximize the utilization of the parking spaces and minimize the total number of spaces needed. Provision of the additional 100 parking spaces above the peak demand allows for a portion of the spaces to be designated as residential parking only for the residents that will live in the apartments. This is needed to improve the attractiveness of the apartments to potential residents. In an effort to minimize parking provisions, the number of residential parking spaces has been limited to 1.0 spaces per unit, which is a reduction from the Quincy Center District zoning requirements.

In order to reduce vehicle trips to/from the Project Area, a number of Transportation Demand Management (TDM) measures have been proposed, which include providing preferential parking to rideshare/carpool participants. In addition to allowing for designated residential parking spaces, the provision of the additional 100 spaces beyond the peak demand allows for designation of preferential parking spaces for such rideshare/carpool participants.

As part of the TDM program, Zip Car service may be provided for employees and residents of the site. This would allow employees and residents to work or live on the site without the need to own a personal vehicle. When a vehicle is needed, the employee or resident could reserve



and rent a vehicle from the Zip Car service. The provision of the additional 100 parking spaces will allow for storage of such Zip Cars when not in use.

The Proponents feel that that Preferred Alternative provides an appropriate number of parking spaces to meet the varied needs of the project. A reduction in the parking provisions would limit the ability to provide preferential parking for rideshare participants, as well as Zip Car service. Eliminating the designated residential parking spaces will decrease the attractiveness of the apartments and hinder the success of the Project. In addition, reducing the available parking on the site would result in additional vehicles circulating through multiple parking areas to find empty parking spaces, which would result in additional traffic congestion and vehicle emissions on are roadways. As a result, the Proponents believe that a reduction in the available parking would compromise the success of the Project while creating additional traffic and GHG emissions impacts.

#### **CONCLUSION**

As part of the evaluation process and in response to the Secretary's Certificate, several alternatives were evaluated as part of this Chapter; No-Build Alternative, the Preferred Redevelopment Building Program, an Alternative Redevelopment Building Program, an Alternative with more open space and an Alternative with less parking. Based on the goals and objectives of the Proponents the Preferred Alternative presented in this document is most appropriate for the redevelopment of Quincy Center and can be appropriately mitigated.

The No-Build Alternative is not practical or feasible as it does not meet the Proponents' redevelopment objectives. The No-Build Alternative would sacrifice the Project's economic development potential to create thousands of much needed new jobs and significant annual tax revenue to the City of Quincy and the Commonwealth.

The No-Build Alternative is also not consistent with the planning and redevelopment initiatives that have been targeted for this area, as described in the Urban Revitalization and Development Plan, Land Disposition Agreement, Quincy Center Zoning Ordinance and other actions taken by the City and the community to revitalize Quincy Center. It is for these reasons that the No Build Alternative is not considered a viable or practical Project alternative.

As part of the planning and design process, different program mixes were evaluated. This Chapter presents the Preferred Building Program mix of uses and an Alternative Building Program mix of uses. Both of these alternatives comprise 3.7 million square feet of building, within the same building footprints and massing, the distinction between the programs is the use mix. The uses for the Preferred Building Program and Alternative Building Program are outlined in Tables 2.1 and 2.5 respectively. The impacts associated with each of these alternatives has been evaluated and summarized in Table 2.9. As outlined in Table 2.9, the Alternative Building Program generates more traffic, generates more wastewater, has a higher water demand and has comparable reductions in CO2 emission when compared to a base line condition. The Proponents believe the Preferred Alternative use mix is most appropriate under the current economic conditions and results in fewer impacts as summarized in Table 2.9. For these reasons the Alternative Building Program has been dismissed, in not providing a practicable alternative to the Project.



The proposed interconnected open spaces are sized appropriately and incorporated into the Project plans for the downtown to provide important public amenities. In addition to the surface public open spaces, green roofs are proposed to provide outdoor amenities for building occupants. The Preferred Alternative balances the mix of urban high density mixed use redevelopment to revitalize the downtown and provide for critical economic development with usable public open space. For this reason, further expanding the planned open space areas would risk compromising the building program and economic development/ revitalization objectives which are advanced by the Project.

The Preferred Alternative has been designed to provide an appropriate number of parking spaces to meet the peak parking demands while providing a minimal number of additional parking spaces to avoid excessive recirculation of vehicles. In addition, the Preferred Alternative allows for the provision of preferential parking spaces for rideshare participants and storage of Zip Cars to maximize the effectiveness of the TDM program. A reduction in the number of parking spaces would compromise the success of the project while generating additional traffic congestion and GHG emissions from recirculation of vehicles looking for empty spaces in multiple lots.

The Preferred Alternative building program (i) will have fewer impacts than the Alternative Building Program, (ii) results in achieving the City's redevelopment goals, (iii) is appropriately parked (iv) provides interconnected public open space within the urban fabric of downtown Quincy and (v) can be properly mitigated. For these reasons, the Preferred Alternative is most suitable and practicable alternatives to successfully advance the redevelopment of Quincy Center consistent with State, regional and local planning and economic development objectives while avoiding, minimizing and mitigating environmental impacts associated with the Project to the maximum extent feasible.



